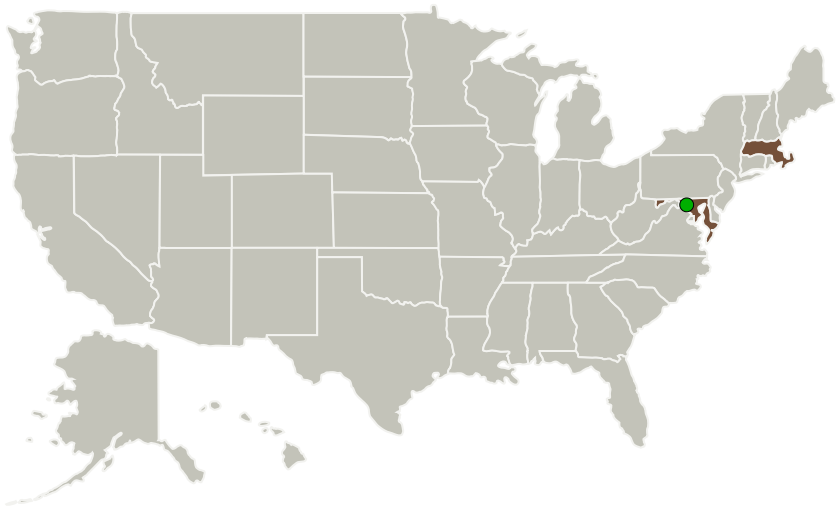
High-Speed Atmospheric Correction Algorithm for Spectral Image Processing, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Generating land and ocean data products from NASA multispectral and hyperspectral imagery missions requires atmospheric correction, the removal of atmospheric transmission and scattering effects that contaminate the measurements. This program led by Spectral Sciences, Inc. (SSI) addresses the challenges of high-speed, high-accuracy atmospheric correction for NASA's current (e.g., Hyperion, ALI) and future (e.g., HyspIRI, LDCM) VSWIR spectral imaging instruments through speed, portability and science upgrades to SSI's FLAASH code. Applications include Direct Broadcast of data products generated on board the planned HyspIRI mission, which will avoid the time-consuming bottleneck of hyperspectral image telemetry. By combining FLAASH with a new radiation transport look-up table, and adding geographic information to the metadata stream, a unique, near-real-time capability would be developed and demonstrated on the NASA Elastic Cloud or Infrastructure As A Service. We will also address the issue of in-scene aerosol optical depth variation in atmospheric correction of very large-area images from HyspIRI and other sensors. In Phase II the software would be implemented on a flight processor to prototype HyspIRI Direct Broadcast. The software will be TRL 3 at the contract start; the Phase I product will be TRL 4 for space operation, TRL 5 for ground operation.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Spectral Sciences, Inc.	Lead Organization	Industry	Burlington, Massachusetts
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Massachusetts

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138548)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Spectral Sciences, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

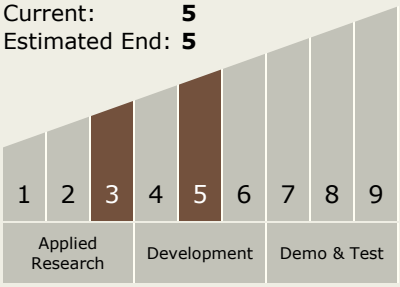
Carlos Torrez

Principal Investigator:

Steven Adler-golden

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System